named after Mr. Horace G. Smith, of Denver, who has long studied the fauna of Colorado, and who went to great trouble to revisit the locality and obtain additional material. The other Cyprinids found by Mr. Smith at Julesburg were *Semotilus atromaculatus macrocephalus* (Girard) and *Phenacobius scopifer* (Cope).

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A BACTERIAL GUMMOSIS OF CHERRIES

CERTAIN varieties of the cultivated sweet cherries grown in the Pacific northwest are very subject to a diseased condition which is commonly known as "cherry gummosis." The disease is characterized by more or less copious exudation of gum from the trunk, branches, spurs and buds as well as by a pustulated appearance of the bark near the diseased areas. Often but little gum is exuded, but in such cases an examination of the affected trees generally discloses discolored tissues which is infiltrated with gum. Such areas are spongy to the touch and are usually discernible by the variation in color of the bark as compared with that of the normal.

Gummosis is found in every cherry growing section of Oregon, but it is in the more humid portion of western Oregon that its prevalence and destructiveness gives it the rank of a major disease, and where its appearance in an orchard is most dreaded by the grower.

Cherry gummosis appeared soon after the first planting of cherries in the state. Its prevalence has varied from season to season, being apparently more abundant in those years when the trees experienced rather sudden extreme variations in temperature after growth had started. This has led observing growers to attribute the trouble chiefly to the climatic factor. The disease appears on a wide range of soil, but the trees growing in the more exposed locations or on poorly drained or shallow soil are generally the worst affected.

Cherry gummosis appears in both a localized and generalized form. In the former, the disease is apparently confined to rather limited areas on the trunk or branches, such areas being most often associated with a blighted spur or bud. In the generalized form, large areas of the trunk or branch may become involved, and it often results in complete girdling. This latter type of gummosis often appears to originate in the crotch of the tree.

The writer was assigned the problem of investigating the possible causes and prevention of cherry gummosis while a student in the Oregon Agricultural College. In the spring of 1909, I noted bacteria in sections of blighted cherry fruit spurs, and upon making cultures from fresh material, found the organisms to be rather constantly associated with such diseased spurs. I had to drop the investigation for the time being on account of the stress of other work, but from the few direct inoculations made into healthy spurs a blighting or gumming occurred.

In the spring of 1910 a large number of cultures were made from material procured in different cherry-growing sections. In the agar plates resulting from such cultures, one type of organism seemed to predominate, and it often appeared in pure culture. From pure cultures thus obtained a series of inoculation experiments were made in which the organisms were transferred from agar slants to healthy fruit spurs by needle pricks. The spurs thus inoculated, blighted or gummed, while the checks healed without blighting or gumming. The typical organism was re-isolated from the inoculated spurs and again inoculated into other healthy fruit spurs. These inoculated spurs again blighted and gummed while the checks remained normal.

During the present season the work has been continued, and several series of inoculations have been made with different strains of the organism. As a result of these inoculations and reinoculations in which I have tried to follow implicitly the Rules of Proof of Pathogenicity as found in Smith's "Bacteria in Relation to Plant Diseases," I believe I have found a specific cause of at least one form of cherry gummosis.

In the two other cases where I have seen bacteria reported as being associated with gummosis of the cherry, the first, that reported by Brzezinski[1] contained very little information concerning the morphological and cultural characteristics of the organism and all attempts at a comparison of Brzezinski's and my organism were abandoned. In the second instance, that reported by Aderhold and Ruhland,[2] more detailed information was given and I have tried to determine the relationships of the two organisms. The morphology of *Bacillus spongiosus*[2] resembles that of my organism very closely. A difference, however, has been noted in certain of the cultural features. I have not been able to obtain the "vacuolated" or "spongy" appearing colonies in agar or gelatin containing grape sugar, a feature which Aderhold and Ruhland regarded as important, and upon which they based the specific name of their organism. In addition, a chromagenic feature appears when my organism is grown on certain media, namely a greening of the agar in plates, stabs, and slants; in gelatin plates and stabs which are liquefied as well as in old broth cultures, a feature which is not attributed to *B. spongiosus*.

I would have preferred to do at least another year's work before publishing the cultural characteristics and describing my organism as a new species. However, as I have severed my connections with the investigation, I feel it necessary to at least tentatively describe and name my organism as follows:

Pseudomonas cerasus n. sp., an actively, motile, rod-shaped schizomycete, bearing one or two polar flagella, 1.5μ to 2.5μ long, and from .5μ to .8μ in diameter. The rods are usually found in pairs and no long chains have been noted. Spores have not been observed and cultures heated at 80° C. for 15 minutes are killed. The organism stains readily with the common stains, is Gram negative and is not acid fast. It grows on all the ordinary cultural media mentioned in the Society's Descriptive Chart excepting Cohn's solution and silicate jelly. It did not form gas in any of the media tried and it prefers an acid medium to one alkaline. The group number is Ps. 211.2322433.

The manner of infection and method of prevention is yet to be worked out. Ordinarily the fruit spur blight is not serious or abundant enough to justify cutting out, but if the generalized form of gummosis should prove to be of a similar specific origin, systematic cutting out, sterilizing of the wounds and burning of the diseased cuttings would be necessary.

Cherry trees weakened through gummosis fall easy prey to various saprophytic fungi, *Schizophyllum commune, Polyporus* sp. and *Polystictus* sp. being the most common. One of the imperfect fungi, which appears very frequently in the gummosis cankers, but whose identity has not been fully determined, may prove to be at least semi-parasitic in nature.

The growers have found by experience that top working resistant stocks will to a great extent prevent the disease from appearing on the body, or crotch of the tree. The Mazzard seedling is most often used for this purpose although the Morello, Duke and a native western cherry have been successfully utilized. The method is to plant the seedling in the orchard in the usual manner and then top work the branches, preferably by budding at least twelve inches above the crotch, when the trees are two or three years old. This eliminates the gummosis factor from the trunk and crotch, but the disease may later affect the fruit-bearing wood.

The Royal Ann, Bing and Lambert, which are the principal commercial varieties, are all susceptible to gummosis; the Lambert being the most resistant.

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[1] Brzezinski, P. J., "Etiologie du chancre et de la gomme des arbres fruitiers," *Comptes Rendus*, 134 (1902), No. 20, pp. 1170–73.

[2] Aderhold and Ruhland, "Ueber der Bakterienbrand der kirchbaume," Fl. No. 39 der Kaiserl. Biolog. Anstalt. für land- und Forstw., Berlin, 1906.